



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

March 16, 2016

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Company, LLC  
President and CNO, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

**SUBJECT: BYRON STATION, UNITS 1 AND 2 - NOTIFICATION OF NRC TRIENNIAL  
FIRE PROTECTION BASELINE INSPECTION REQUEST FOR INFORMATION;  
INSPECTION REPORT 05000454/2016007; 05000455/2016007**

Dear Mr. Hanson:

On June 6, 2016, the U.S. Nuclear Regulatory Commission (NRC) will begin a triennial fire protection baseline inspection at your Byron Station, Units 1 and 2. This inspection will be performed in accordance with Inspection Procedure 71111.05T, the NRC's baseline fire protection inspection procedure.

Changes were made to the Inspection Procedure 71111.05T, which now requires the fire protection inspection to review your actions to mitigate postulated events that could potentially cause loss of large areas of power reactor facilities due to explosions or fires. This requirement was implemented by the issuance of the Interim Compensatory Measures Order EA-02-026, Section B.5.b, and the subsequent requirements of Title 10, Code of Federal Regulations, Part 50.54(hh)(2), which are collectively referred to as B.5.b requirements. During this inspection, the B.5.b requirements review will be performed during the first onsite week of the inspection starting on June 8, 2016.

The schedule for the onsite inspection activity is as follows:

- Information Gathering Visit: June 6 – 8, 2016;
- B.5.b Requirements: June 8 – 10, 2016; and
- Fire Protection Inspection: June 20 – 24 and July 5 – 8, 2016.

The purpose of the information gathering visit is: (1) to obtain information and documentation needed to support the inspection; (2) to become familiar with the Byron Station's Fire Protection Programs, fire protection features, post-fire safe shutdown capabilities, and plant layout; and (3) to arrange administrative details, such as office space, availability of knowledgeable office personnel and to ensure unescorted site access privileges.

Experience has shown that the baseline fire protection inspections are extremely resource intensive both for the NRC inspectors and the licensee staff. In order to minimize the inspection impact on the site and to ensure a productive inspection for both organizations, we have enclosed a request for documents needed for the inspection. These documents have been divided into four groups.

The first group lists information necessary to aid the inspection team in choosing specific focus areas for the inspection. It is requested that this information be provided to the lead inspector via mail or electronically no later than May 20, 2016. The second group also lists information and areas for discussion necessary to aid the inspection team in choosing specific fire protection focus areas for the inspection and to ensure that the inspection team is adequately prepared for the inspection. It is requested this information be available during the information gathering visit June 6, 2016. The third group of requested documents consists of those items that the team will review, or need access to, during the inspection. Please have this information available by the first day of the second onsite inspection week June 20, 2016. The fourth group lists the information necessary to aid the inspection team in tracking issues identified as a result of the inspection. It is requested that this information be provided to the lead inspector as the information is generated during the inspection. It is important that all of these documents are up to date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection.

The lead inspector for this inspection is Mr. Mark Jeffers. We understand that our regulatory contact for this inspection is Ms. Amanda Corrigan of your organization. If there are any questions about the inspection or the material requested, please contact the lead inspector at (630) 829-9798 or via e-mail at [Mark.Jeffers@nrc.gov](mailto:Mark.Jeffers@nrc.gov).

This letter does not contain new or amended information collection requirements subject to the *Paperwork Reduction Act of 1995* (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, Control Number 3150-0011. The NRC may not conduct or sponsor, and a person is not required to respond to a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mark Jeffers, Reactor Inspector  
Engineering Branch 3  
Division of Reactor Safety

Docket Nos. 50-454; 50-455  
License Nos. NPF-37; NPF-66

Enclosure:  
Information Request for Fire Protection Inspection

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## REQUEST FOR INFORMATION – FIRE PROTECTION INSPECTION

**Inspection Report:** 05000454/2016007; 05000455/2016007

**Onsite Inspection Dates:** June 6 – 8, 2016, Information Gathering Visit  
June 8 – 10, 2016, B.5.b Requirements  
June 20 – 24, 2016, Fire Protection Inspection  
July 5 – 8, 2016, Fire Protection Inspection)

**Inspection Procedures:** IP 71111.05T, “Fire Protection (Triennial)”  
IP 71152, “Identification and Resolution of Problems”

**Inspectors:**

Mark Jeffers Reactor Inspector (Lead) (630) 829-9798 <a href="mailto:Mark.Jeffers@nrc.gov">Mark.Jeffers@nrc.gov</a>	Alan Dahbur Senior Reactor Inspector (630) 829-9810 <a href="mailto:Alan.Dahbur@nrc.gov">Alan.Dahbur@nrc.gov</a>	Dariusz Szwarc Senior Reactor Inspector (630) 829-9803 <a href="mailto:Dariusz.Szwarc@nrc.gov">Dariusz.Szwarc@nrc.gov</a>
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### ***I. Information Requested Prior To the Information Gathering Visit***

The following information is requested by May 20, 2016. If you have any questions regarding this request, please call the lead inspector as soon as possible. All information should be sent to Mr. Mark Jeffers (e-mail: [Mark.Jeffers@nrc.gov](mailto:Mark.Jeffers@nrc.gov)). Electronic media is preferred. The preferred file format is a searchable “pdf” file on a compact disk (CD). The CD should be indexed and hyper-linked to facilitate ease of use, if possible. Please provide three copies of each CD submitted (one for each inspector).

1. The most risk significant fire areas as determined by probabilistic risk analyses, if available. Otherwise, the reactor plant's Individual Plant Examination for External Events for fire and results of any post- Individual Plant Examination for External Events reviews for fire.
2. A copy of the current version of the Fire Protection Program, fire hazards analysis, safe shutdown analysis, updated safety analysis report, technical specifications, license (including the fire protection license condition), and technical requirements manual or equivalent for fire protection structures, systems, and components.
3. A list of fire areas requiring alternative shutdown capability, (i.e., those areas for which Title 10, *Code of Federal Regulations* [CFR], Part 50, Appendix R, Section III G, requirements are satisfied under Section III.G.3), or where both safe shutdown trains can be affected.

## REQUEST FOR INFORMATION – FIRE PROTECTION INSPECTION

4. Plant operating procedures which would be used and describe shutdown for a postulated fire (for both areas requiring alternative shutdown and areas which do not require alternative shutdown). Only those procedures with actions specific to shutdown in the event of a fire need be included. In addition, please include those procedures which operators would use for initial response to a fire, such as annunciator or alarm response procedures, the procedure used for activating the fire brigade, and the procedure which directs operators to the applicable safe shutdown procedure.
5. Analysis performed in support of plant evaluation regarding multiple spurious operation (MSO), which includes the following:
  - a. List of identified multiple spurious fire-induced circuit failure configurations.
  - b. List of the generic and plant specific MSOs.
  - c. Results of expert panel process and associated review/evaluation of the generic and plant specific MSOs and existing safe shutdown analysis.
  - d. Evaluations and corrective actions taken for resolution of MSO issues.

### ***II. Information Requested During the Information Gathering Visit (June 6, 2016)***

The following information is requested to be provided to the inspection team during the onsite information gathering visit. Except for Item 8, it is requested that the following information be provided on three sets of CDs (searchable, if possible) with the B.5.b Mitigating Strategies information (Items 8.a through 8.h) provided on one separate CD. In addition, one set of hard copy drawings are requested for Items 4.a. through 4.d.

1. One set of hard-copy documents for facility layout drawings which identify plant fire area delineation; areas protected by automatic fire suppression and detection; and locations of fire protection equipment.
2. Licensing Information:
  - a. All Nuclear Regulatory Commission (NRC) Safety Evaluation Reports (SERs) applicable to fire protection (specifically including those SERs referenced by the plant fire protection license condition) and all licensing correspondence referenced by the SERs;
  - b. All licensing correspondence associated with the comparison to Standard Review Plan (NUREG-0800), Section 9.5.1 or equivalent for licensing purposes;
  - c. Exemptions from 10 CFR 50.48 and 10 CFR Part 50, Appendix R, and associated licensing correspondence;
  - d. For pre-1979 plants, all licensing correspondence associated with those sections of 10 CFR Part 50, Appendix R, that are not applicable to the plant under 10 CFR Part 50.48(b)(1). Specifically, the licensing correspondence associated with those fire protection features proposed or implemented by the licensee that have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position APCS 9.5-1 reflected in the NRC fire protection

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SERs issued before February 19, 1981, (10 CFR 50.48(b)(1)(i)); or those fire protection features, which were accepted by the NRC staff in comprehensive fire protection SERs issued before Appendix A to Branch Technical Position APCS 9.5-1 was published in August 1976 (10 CFR 50.48(b)(1)(ii)); and

- e. The final safety analysis report sections applicable to fire protection, FHA, and SSA in effect at the time of original licensing.
3. Fire Protection Program:
- a. A listing of changes made to the Fire Protection Program since the last triennial fire protection inspection;
  - b. For pre-1979 plants, a listing of the protection methodologies identified under 10 CFR Part 50, Appendix R, Section III.G used to achieve compliance for selected fire zones/areas (to be determined during information gathering visit). That is, please specify whether 3-hour rated fire barriers; (Section III.G.2.a), 20 foot separation along with detection and suppression; (Section III.G.2.b), 1-hour rated fire barriers with detection and suppression; (Section III.G.2.c), or alternative shutdown capability; (Section III.G.3) is used as a strategy for each selected fire zone/area;
  - c. A list of Generic Letter 86-10 evaluations (i.e., a list of adverse to safe shutdown evaluations);
  - d. A list of applicable codes and standards related to the design of plant fire protection features. The list should include National Fire Protection Association code versions committed to (i.e., the National Fire Protection Association Codes of Record); and
  - e. List of plant deviations from code commitments and associated evaluations.
4. Facility Information:
- a. Piping and instrumentation (flow) diagrams showing the components used to achieve and maintain hot standby and cold shutdown for fires outside the control room, those components used for those areas requiring alternative shutdown capability, and systems relied upon for B.5.b mitigation strategies. These can be of the type that are used for training;
  - b. One-line schematic drawings of the electrical distribution system for 4160 Volts alternating current (Vac) down to 480Vac;
  - c. One-line schematic drawings of the electrical distribution system for 250 Volts direct current and 125 Volts direct current systems as applicable;
  - d. Logic diagrams showing the components used to achieve and maintain hot standby and cold shutdown; and
  - e. Safe shutdown cable routing database (requested electronically, such as on compact disc, if available).

## REQUEST FOR INFORMATION – FIRE PROTECTION INSPECTION

5. Operations Response for Fire Protection:
  - a. Pre-fire plans for selected fire zones/areas (to be determined during information gathering visit);
  - b. Plant operating procedures which specify the initial operations response to a fire alarm or annunciator; and
  - c. Procedure for calling out the fire brigade and requesting offsite assistance.
6. Corrective Actions:
  - a. Listing of open and closed fire protection condition reports (i.e., problem identification forms and their resolution reports) since the date of the last triennial fire protection inspection; and
  - b. List of current fire impairments, including duration.
7. General Information:
  - a. A listing of abbreviations and/or designators for plant systems;
  - b. Organization charts of site personnel down to the level of fire protection staff personnel; and
  - c. A phone list for onsite licensee personnel.
8. B.5.b Mitigating Strategies:
  - a. A list of all modifications to regulatory commitments made to meet the requirements of Section B.5.b of the ICM Order, EA-02-026, dated February 25, 2002, the subsequently imposed license conditions, and 10 CFR 50.54(hh)(2);
  - b. Copies of procedures/guidelines that were revised or generated to implement the mitigation strategies. These could be extensive damage mitigation guidelines, severe accident management guidelines, emergency operating procedures, abnormal operating procedures, etc.;
  - c. A matrix that shows the correlation between the mitigation strategies identified in Nuclear Energy Institute 06-12 and the site-specific procedures or guidelines that are used to implement each strategy;
  - d. A listing of engineering evaluations/calculations that were used to verify engineering bases for the mitigation strategies;
  - e. Copies of procedures used to inventory equipment (hoses, fittings, pumps, etc.) required to be used to implement the mitigation strategies;
  - f. A list of B.5.b mitigating strategies, if any, which have implementing details that differ from that documented in the submittals and the safety evaluation report;

## REQUEST FOR INFORMATION – FIRE PROTECTION INSPECTION

- g. Copies of Memoranda of Understanding (e.g., with local fire departments) required to implement any mitigating strategies; and
  - h. A list of changes made to B.5.b mitigating strategies and associated procedures since the previous NRC inspection of B.5.b mitigating strategies.
9. Onsite Discussions:

In addition, during the information gathering visit, it is requested that licensee staff be available for the following:

- a. Informal discussion on plant procedures operators would use in the event of fire or explosion (including B.5.b mitigation strategies) and under what conditions would the plant be shutdown using alternative shutdown methodology;
- b. Informal discussion on the plant's safe shutdown cable routing database and the plant-wide cable routing database, as applicable; and
- c. A tour of alternative shutdown and risk significant fire areas.
- d. A discussion of scheduling of fire drills which may occur during the inspection so that the inspectors may be able to observe a fire drill, if possible.

### ***III. Information Requested to be Available on first Day of the Second Onsite Inspection Week (June 20, 2016)***

The following information is requested to be provided on the first day of inspection. It is requested that this information be provided on three sets of CDs (searchable, if possible).

1. Program Procedures:
- a. Procedures for:
    - i. Administrative controls (such as allowed out of service times and compensatory measures) for fire protection systems and components
    - ii. Control of transient combustibles
    - iii. Control of hot work
  - b. List of maintenance and surveillance testing procedures for alternative shutdown capability and fire barriers, detectors, pumps, and suppression systems; and
  - c. List of maintenance procedures which routinely verify fuse breaker coordination in accordance with the post-fire safe shutdown coordination analysis.

## REQUEST FOR INFORMATION – FIRE PROTECTION INSPECTION

2. Design and Equipment Information:
  - a. Coordination calculations and/or justifications that verify fuse/breaker coordination for selected fire zones/areas (***to be determined during information gathering visit***) that are fed off of the same electrical buses as components in the protected safe shutdown train;
  - b. Copies of significant fire protection and post-fire safe shutdown related design change package descriptions (including their associated 10 CFR 50.59 evaluations) and Generic Letter 86-10 (or adverse to safe shutdown) evaluations;
  - c. Gaseous suppression system pre-operational testing, if applicable, for selected fire zones/areas (to be determined during information gathering visit);
  - d. Hydraulic calculations and supporting test data which demonstrate operability for water suppression systems, if applicable, for selected fire zones/areas (to be determined during information gathering visit);
  - e. Alternating current coordination calculations for 4160Vac down to 480Vac electrical systems; and
  - f. List of all fire protection or Appendix R calculations.
3. Assessment and Corrective Actions:
  - a. The three most recent fire protection Quality Assurance audits and/or fire protection self-assessments.
4. Any updates to information previously provided.

### ***IV. Information Requested to Be Provided Throughout the Inspection***

1. Copies of any corrective action documents generated as a result of the inspection team's questions or queries during this inspection.
2. Copies of the list of questions submitted by the inspection team members and the status/resolution of the information requested (provided daily during the inspection to each inspection team member).

If you have questions regarding the information requested, please contact the lead inspector.



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Sincerely,  
/RA/

Mark Jeffers, Reactor Inspector  
Engineering Branch 3  
Division of Reactor Safety

Docket Nos. 50-454; 50-455  
License Nos. NPF-37; NPF-66

Enclosure:  
Information Request for Fire Protection Inspection

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